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## EUROPEAN PATENT APPLICATION

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㉓ A process for preparing a confectionery product, hard boiling, containing mainly sugar alcohols and abundant xylitol.

㉔ A process for preparing a hard confectionery product comprising sugar alcohols, abundant xylitol and optional additives by mixing the ingredients in a multistep mixing process including steps of heating and cooling.

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A process for preparing a hard confectionery product containing mainly sugar alcohols and abundant xylitol

The present invention is directed to a process for preparing a hard confectionery product containing mainly sugar alcohols and abundant xylitol. The hard confectionery product refers chiefly to candy and granular products.

5 Traditionally, hard candy like this is prepared from mixtures of saccharose and glucose syrup, the said mixtures being concentrated by evaporating the water, and of the mass thus obtained the final product is formed either by casting in moulds or by using confectionery rollers. These structurally "glasslike" confectionery products contain large amounts of saccharose and glucose syrup, which components are not particularly beneficial for the teeth. The aim has, therefore, been to replace the saccharose with xylitol and the glucose syrup with hydrogenated starch syrup or lactitol.

10 Finnish patent publication no. 61265 describes a process in which 10 - 30 % by weight of xylitol powder is added to a xylitol melt and the melt is maintained at a temperature not exceeding xylitol's melting point of 96°C. The melt obtained is poured into moulds and allowed to cool. This known process is not continuous, it is technically difficult to realize, and is thus not very well suited for industrial production.

15 Finnish patent application no. 885397 also describes a process for preparing candies containing xylitol and sugar alcohols. According to the process, a mixture containing xylitol and maltitol is melted and coarse xylitol powder is added to the melt and from the mixture thus obtained candies are formed. This process does not, however, lead to a satisfactory end result and the process cannot be used on an industrial scale due to the hygroscopicity of xylitol. The process produces a hygroscopic mixture which is difficult to work. It does not maintain its shape and is a perishable product.

20 When xylitol is used in preparing candy, a problem is presented by the fact that from xylitol cannot be made by boiling a mass which could be treated with a traditional confectionery roller, as the mass cannot be made to crystallize satisfactorily. Furthermore, if hard candy can be formed of a mixture consisting of xylitol and sugar alcohol, the final product is usually extremely hygroscopic and sticky.

25 To solve the above-mentioned problems, a process is now put forth in which xylitol, at least one additional sugar alcohol and possible additives are heated at least to the mixture's melting point, of which process it is characteristic that the mixture contains 2 - 10 % by weight of xylitol, 45 - 70 % by weight of other sugar alcohols, e.g. maltitol, lactitol, and possibly at most 0.5 % by weight of emulsifier; that the mixture is cooled to about 110 - 120°C and to it is admixed 10 - 20 % by weight of coarse xylitol, keeping the mixture molten during mixing; 30 that the mixture is cooled to about 92°C, and 2 - 10 % by weight of xylitol is admixed, and after this is admixed a mixture, which contains 2 - 10 % by weight of xylitol, about 0.5 % by weight of fat and flavouring, and thereafter a further, about 10 - 20 % by weight of coarse xylitol is admixed, the percentages by weight having been calculated from the final weight of the mixture, and which mixtures are heated during mixing, and finally the mixture obtained is worked into the desired shape by a conventional means, preferably with a confectionery roller.

35 In the preferred embodiment, the xylitol and/or xylitol-containing mixture to be added to the mixture is pre-heated, preferably to about 45°C. The above-mentioned preheatings facilitate mixing and reduce the hygroscopicity of the final product.

To the mixture may also be added additives generally used in the confectionery industry in order to improve the workability of the mixture, for example emulsifier, e.g. glycerol monostearate or lecithin.

40 The addition of fat and flavouring to the mixture improves the texture and taste of the final product.

The coarse xylitol added last to the mixture is added under rapid mixing. In this way, some of the xylitol will remain in crystalline form and it is important that the temperature of the mass is over 60°C during the addition of xylitol, so that the mass remains homogeneous.

The invention is described in greater detail below with reference to the following examples.

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#### EXAMPLE 1

|                       |         |
|-----------------------|---------|
| "Lycasin"             | 25.0 kg |
| xylitol               | 1.2 kg  |
| glycerol monostearate | 0.1 kg  |

50 The mixture is boiled to 175°C and cooled in a vacuum to 120°C. The mass is transferred to a heating table and allowed to cool to 110°C. 5.0 kg of coarse xylitol is added while mixing well. The mass must be at a temperature of over 95°C throughout the mixing in order that the xylitol will melt. The mass is cooled to 92°C.

To the cooled mass is admixed 1.0 kg of coarse xylitol preheated to 45°C. Immediately after this, the following premixed mixture is added to the mass under rapid mixing:

|                       |        |
|-----------------------|--------|
| xylitol               | 1.0 kg |
| molten coconut butter | 0.2 kg |
| flavouring            | 0.1731 |

After this, the remaining 5.1 kg of preheated coarse xylitol is added evenly, under rapid mixing, to form a homogeneous mass. It should be ensured that mixing is carried out so that at the end of it the mass is at a temperature of at least 60°C.

The well-mixed mass is cooled to 45 - 50°C and worked with a traditional confectionery roller machine into the desired shape. The candy pieces obtained are non-sticky and keep their shape well.

The candy pieces are hard-granulated with xylitol until a total xylitol content of 50.0% is obtained for the product. If desired, the finished products may be polished.

The hard-granulation with xylitol is carried out by moistening the candy pieces in a grain drum with 72% xylitol solution to which 6% gum arabic solution (50% aqueous solution) has been added as a thickening agent. The moistened blanks are dried, moistening is repeated and the process is continued until the desired xylitol content is obtained for the final product.

#### EXAMPLE 2

|    |                       |         |
|----|-----------------------|---------|
| 15 | "Lycasin"             | 24.2 kg |
|    | xylitol               | 2.12 kg |
|    | glycerol monostearate | 0.09 kg |

The mixture is boiled to 175°C and cooled in a vacuum to 120°C. The mass is transferred to a heating table and allowed to cool to 110°C. 6.68 kg of coarse xylitol is added while mixing well. The mass must be at a temperature of over 95°C throughout the mixing in order that the xylitol will melt. The mass is cooled to 92°C.

To the cooled mass is admixed 1.0 kg of coarse xylitol preheated to 45°C. Immediately after this, the following premixed mixture is added to the mass under rapid mixing:

|    |                       |        |
|----|-----------------------|--------|
| 20 | xylitol               | 1.0 kg |
|    | molten coconut butter | 0.2 kg |
| 25 | flavouring            | 0.1731 |

After this, the remaining 7.35 kg of preheated coarse xylitol is added evenly, under rapid mixing, to form a homogeneous mass. It should be ensured that mixing is carried out so that, when the mixing process is concluded, the mass is at a temperature of at least 60°C.

The well-mixed mass is cooled to 45 - 50°C and worked with a traditional confectionery roller machine into the desired shape. The candy pieces are non-sticky and maintain their shape well.

#### EXAMPLE 3

|    |                       |         |
|----|-----------------------|---------|
| 35 | "Lycasin"             | 24.5 kg |
|    | xylitol               | 5.3 kg  |
|    | glycerol monostearate | 0.09 kg |

The mixture is boiled to 175°C and cooled in a vacuum to 120°C. The mass is transferred to a heating table and allowed to cool to 110°C. 1.6 kg of coarse xylitol is added while mixing well. The mass must be at a temperature of over 95°C throughout the mixing in order that the xylitol will melt. The mass is cooled to 92°C.

To the cooled mass is admixed 1.0 kg of coarse xylitol preheated to 45°C. Immediately after this, the following premixed mixture is added to the mass under rapid mixing:

|    |                       |        |
|----|-----------------------|--------|
| 40 | xylitol               | 1.0 kg |
|    | molten coconut butter | 0.2 kg |
|    | flavouring            | 0.1731 |

After this, the remaining 5.0 kg of preheated coarse xylitol is added evenly, under rapid mixing, to form a homogeneous mass. It should be ensured that mixing is carried out so that when the mixing process is concluded, the mass is at a temperature of at least 60°C.

The well-mixed mass is cooled to 45 - 50°C. The mass thus obtained is extremely sticky and very difficult to work with a traditional confectionery roller machine. The candy pieces prepared in this way stick to each other and do not maintain their shape.

#### EXAMPLE 4

|    |           |         |
|----|-----------|---------|
| 55 | "Lycasin" | 24.5 kg |
|    | xylitol   | 1.9 kg  |

The mixture is boiled to 175°C and cooled in a vacuum to 120°C. The mass is transferred to a heating table and allowed to cool to 110°C. 5.0 kg of coarse xylitol is added while mixing well. The mass must be at a temperature of over 95°C throughout the mixing in order that the xylitol will melt. The mass is cooled to 92°C.

To the cooled mass is admixed 1.0 kg of coarse xylitol preheated to 45°C. Immediately after this, the following premixed mixture is added to the mass under rapid mixing:

|            |        |
|------------|--------|
| xylitol    | 1.0 kg |
| flavouring | 0.1731 |

- 5 After this, the remaining 5.0 kg of preheated coarse xylitol is added evenly, under rapid mixing, to form a homogeneous mass. It should be ensured that mixing is carried out so that, when the mixing process is concluded, the mass is at a temperature of at least 60°C.

The well-mixed mass is cooled to 45 - 50°C. The mass thus obtained is somewhat sticky and very difficult to work with a traditional confectionery roller machine. The candy pieces prepared in this way are sticky and do not maintain their shape.

#### EXAMPLE 5

|                       |         |
|-----------------------|---------|
| water                 | 6.2 kg  |
| lactitol              | 18.4 kg |
| xylitol               | 1.9 kg  |
| glycerol monostearate | 0.09 kg |

The mixture is boiled to 170°C and cooled in a vacuum to 120°C. The mass is transferred to a heating table and allowed to cool to 110°C. 5.0 kg of coarse xylitol is added while mixing well. The mass must be at a temperature of over 95°C throughout the mixing in order that the xylitol will melt. The mass is cooled to 92°C.

To the cooled mass is admixed 1.0 kg of coarse xylitol preheated to 45°C. Immediately after this, the following premixed mixture is added to the mass under rapid mixing:

|                       |        |
|-----------------------|--------|
| xylitol               | 1.0 kg |
| molten coconut butter | 0.2 kg |
| flavouring            | 0.1731 |

After this, the remaining 5.0 kg of preheated coarse xylitol is added evenly, under rapid mixing, to form a homogeneous mass. It should be ensured that mixing is carried out so that, when the mixing is concluded, the mass is at a temperature of at least 60°C.

The well-mixed mass is cooled to 45 - 50°C and worked with a traditional confectionery roller machine into the desired shape. The caramel shapes obtained are non-sticky and maintain their shape well.

#### EXAMPLE 6

|                       |         |
|-----------------------|---------|
| water                 | 6.2 kg  |
| "Palatines"           | 18.4 kg |
| xylitol               | 1.9 kg  |
| glycerol monostearate | 0.09 kg |

The mixture is boiled to 175°C and cooled in a vacuum to 120°C. The mass is transferred to a heating table and allowed to cool to 110°C. 5.0 kg of coarse xylitol is added while mixing well. The mass must be at a temperature of over 95°C throughout the mixing in order that the xylitol will melt. The mass is cooled to 92°C.

To the cooled mass is admixed 1.0 kg of coarse xylitol preheated to 45°C. Immediately after this, the following premixed mixture is added to the mass under rapid mixing:

|                       |        |
|-----------------------|--------|
| xylitol               | 1.0 kg |
| molten coconut butter | 0.2 kg |
| flavouring            | 0.1731 |

After this, the remaining 5.0 kg of preheated coarse xylitol is added evenly, under rapid mixing, to form a homogeneous mass. It should be ensured that mixing is carried out so that, when the mixing is completed, the mass is at a temperature of at least 60°C.

The well-mixed mass is cooled to 45 - 50°C and worked with a traditional confectionery roller machine into the desired shape. The candy pieces obtained are non-sticky and maintain their shape well.

#### Claims

- 55 1. A process for preparing a hard confectionery product containing mainly sugar alcohols and abundant xylitol in which xylitol, at least one additional sugar alcohol and possible additives are heated at least to the mixture's melting point,  
characterized in that the mixture contains 2 - 10 % by weight of xylitol, 45 - 70 % by weight of other sugar

alcohols, e.g. maltitol, lactitol, and possibly at most 0.5 % by weight of emulsifier; that the mixture is cooled to about 110 - 120°C and to it is admixed 10 - 20 % by weight of coarse xylitol, keeping the mixture molten during mixing; that the mixture is cooled to about 92°C and 2 - 10 % by weight of xylitol is admixed, and after this is admixed a mixture, which contains 2 - 10 % by weight of xylitol about 0.5 % by weight of fat and flavouring, and thereafter is admixed a further, about 10 - 20 % by weight of coarse xylitol, the percentages by weight having been calculated from the final weight of the mixture, and which mixtures are heated during mixing, and finally the mixture obtained is worked into the desired shape by a conventional means, preferably with a confectionery roller.

- 5            10        2. A process as claimed in claim 1, characterized in that the xylitol and/or xylitol-containing mixture is pre-heated, preferably to 45°C.

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## **EUROPEAN SEARCH REPORT**

**Application Number**

EP 91 85 0225

| DOCUMENTS CONSIDERED TO BE RELEVANT  |   |                   |   |
|--|---|-------------------|---|
| Category   | Citation of document with indication, where appropriate, of relevant passages                       | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.5) |
| X  | EP-A-0 370 761 (OY RETTIG AB)<br>* examples 1-3; claims 1-7 *; & FI - A<br>- 885397 (cat. D)<br>--- | 1                 | A 23 G 3/00                                   |
| X  | WO-A-9 107 100 (SUOMEN XYROFIN OY)<br>* abstract; example 1; claims 1-12 *                          | 1                 |   |
| X  | EP-A-0 017 184 (AUGUST STORCK KG)<br>* claims 1-3 *   | 1                 |   |
| A, P   | EP-A-0 398 279 (CULTOR OY)<br>* claims 1-11 *   | 1                 |   |
|  | -----   |                   |   |
|  |   |                   | TECHNICAL FIELDS<br>SEARCHED (Int. Cl.5)      |
|  |   |                   | A 23 G 3/00                                   |
| The present search report has been drawn up for all claims                       |   |                   |   |
| Place of search  | Date of completion of the search  | Examiner          |   |
| BERLIN   | 24-01-1992  | SCHULTZE D        |   |
| CATEGORY OF CITED DOCUMENTS  |   |                   |   |
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